Maps Depicting Comparison Between COPC Concentrations Found in Samples Taken From Sections 3, 4, and 5 of the NSDD and Selected Screening Levels

In support of the continued investigation of contaminant levels in Sections 3, 4, and 5 of the North-South Diversion Ditch (NSDD) (i.e., Solid Waste Management Unit [SWMU] 58), maps were prepared showing the detected concentrations relative to selected screening levels. These screening values were the recreational user and industrial worker no action and action risk-based screening values and surface soil background concentrations from *Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky. Volume 1. Human Health* (DOE/OR/07-1506&D2) (i.e., Risk Methods Document)]. In addition, data were plotted on a series of X-Y graphs to depict the trends in contaminant of potential concern (COPC) concentrations in relation to distance from the PGDP security fence and in relation to these screening values.

Data were taken from the Paducah Gaseous Diffusion Plant – Oak Ridge Environmental Information System (Paducah OREIS) in December 2002. Data selected were from samples collected within one of the remediation units (RUs) that define the extent of the potential response action for SWMU 58. These RUs and the samples collected within each are shown on the figures. All samples used to prepare the maps were collected from 0-2 ft below ground surface (bgs).

After data were compiled, procedures contained in the Risk Methods Document were used to prepare a representative data set. These procedures used the following data screens.

(1) Examine data qualifiers and retain only those analytes that were detected at least one time.
(2) Compare the maximum detected concentration of retained analytes against child resident no action screening values taken from Table A.17 in the Risk Methods Document. Retain those analytes that have a maximum detected concentration that exceeds this no action screening value.
(3) Compare the maximum detected concentration of retained analytes against the provisional surface soil background concentrations taken from Table A.12 in the Risk Methods Document. Retain those analytes that have a maximum detected concentration that exceeds this background concentration.
(4) Remove data from samples collected prior to January 1, 1995.
(5) Remove results for essential nutrients (i.e., sodium) and for short half-life radionuclides (i.e., ^{228}Th).

The resulting list of COPCs is as follows: arsenic, beryllium, iron, manganese, mercury, silver, thallium, uranium (as a metal), vanadium, total PCBs, ^{137}Cs, ^{237}Np, ^{239}Pu, ^{230}Th, ^{234}U, ^{235}U, and ^{238}U.

Figure 1 shows a compilation of all sample stations in which one or more sampling results have a COPC concentration detected at greater than screening levels. In this map, a black circle is used for all sampling stations. A blue circle is used if the maximum sampling result at a station is greater than the higher of the aforementioned screening values; a red circle is used if the maximum sampling result at a station is greater than the action risk-based screening value. No red circles are shown in maps since no samples were detected above action levels. Additionally, for each sample station, a table is shown summarizing the COPC for which the sampling station exceeded, the maximum result detected, and the screening level for the COPC.

The x-y graphs in Figs. 2 through 24 depict the concentrations of each of the COPCs at a station relative to the COPC's no action screening value (i.e., the lesser of the industrial use and child recreational use no action screening value shown as a blue line) and background concentration (shown as a green line). Note that results are shown within ditch section with the distance between samples and from the PGDP fence indicated by the spacing of stations along the x-axis. The graph for samples in Section 3 of the ditch is plotted at 300 to 2100 ft from the fence. For Section 4, the graph is plotted at 2100 to 4000 ft from the fence. For Section 5, the graph is plotted at 4000 to 8000 ft from the fence. Additionally, the

related PGDP action screening levels from the Risk Methods Document are provided for reference in text boxes in red text on the graph. Finally, nondetect results are reported at one-half their detection limit and are shown using an open square symbol, and detected results are reported at their full value and are shown using a solid square symbol.

The maps (Figs. 2 – 24) show the spatial distribution of sampling and the locations where selected screening levels are exceeded. In these maps, an open circle is used if no results for a COPC were available at samples taken at a station; a green circle is used if the all sampling results at a station are nondetect results or if the maximum sampling result at a station is less than the maximum of the COPC's no action risk-based screening value and background concentration; a blue circle is used if the maximum sampling result at a station is greater than the higher of the aforementioned screening values; and, a red circle is used if the maximum sampling result at a station is greater than the action risk-based screening value. No red circles are shown in maps since no samples were detected above action levels.